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THE VALUE OF GYPSY MOTH CONTROL AND EXTERMINATION TO UNINFESTED REGIONS OF THE UNITED STATES

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UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
DIVISION OF GYPSY AND BROWN-TAIL MOTHS CONTROL

THE VALUE OF GYPSY MOTH CONTROL AND EXTERMINATION TO UNINFESTED REGIONS OF THE UNITED STATES

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Greenfield, Massachusetts

Work in preventing the spread of the gypsy moth by the U. S. Department of Agriculture was begun in 1906 as a result of insistence by the New England States that Federal help be extended in combating this introduced pest. For 10 years prior to 1900 the State of Massachusetts had made an attempt, single handed, to exterminate the insect from the territory covering about 200 square miles around Boston. This work was discontinued as a result of apathy on the part of the public because the insect had been reduced so that no visible injury could be noted, the antagonism of certain elements who opposed it, and continued failure to finance the program adequately so as to assure eventual success. Subsequent experience in dealing with this insect clearly justifies the belief that if adequate financial support had been given and the work continued the infestation could have been entirely eradicated in this country.

The tremendous increase and spread of the insect, during the five years after the work was discontinued caused public demands for relief from unbearable conditions, and, after the State of Massachusetts had made appropriations aggregating $375,000 and passed a law requiring property owners to clear up infestation on their own premises, an appeal to the Federal Government was given favorable consideration and work was begun with the primary object of preventing the spread of the insect. Restrictions were placed on the movement of products likely to carry the pest, parasites and natural enemies were introduced from foreign countries, part of the expense being borne by the State of Massachusetts, and clean-up work along the principal lines of travel out of the infested area was carried on for a number of years to prevent long-distance spread through vehicular means. The introduction and breeding of many species of parasites was continued, and they were colonized in the infested territory as rapidly as possible. In 1913, after the passage of the Federal Plant Quarantine Act, the infested territory was placed under Federal quarantine requiring the inspection and certification of freedom from infestation of products moving beyond the known infested area. By this time all the New England States were involved, but only a few infestations had been found in Vermont and Connecticut. Federal field operations were confined to the outlying area, it being the policy of the States to confine their efforts to cleaning up the older infested territory.

A large amount of experimental work was conducted to improve the field methods which had been worked out in previous years by the State of Massachusetts. New facts were discovered in connection with the feeding habits of the insect, and advantage was taken of this information in connection with the removal of trees that were most susceptible to infestation and the encouragement of those species that were least attacked by the insect.

Improvement in field methods and the development of high-pressure spraying resulted. Facts concerning the spread of the insect by the wind were determined. They indicated that for the eastern part of New England the main drift of small caterpillars immediately after hatching was usually toward the north or northeast.

During the war period conditions were unfavorable for preventing spread. The loss of efficient personnel and the constant turnover of men, together with extraordinary increase in costs, made progress difficult. By the fall of 1922 scattered colonies were found farther west in Vermont, Massachusetts, and Connecticut, and in New York State near the Massachusetts State line. There was every indication of the continued spread of the insect unless more intensive work was done. A conference was held at Albany, N. Y., attended by entomologists from all the States concerned, the Bureau of Entomology at Washington, and the Dominion entomologist's office in Canada, to discuss the situation. It was decided that a control area, afterwards designated as a barrier zone, should be established, about 30 miles in width, extending from the Canadian border to Long Island Sound, and bounded on the west by the Hudson River. About one-half was located in New York and the balance in western Vermont, Massachusetts, and Connecticut. The purpose was to keep it as free as possible from infestation, thereby preventing the westward spread of the insect. The work has been financed by the Federal Government, although the State of New York, through its own organization, takes care of most of the work in this strip in its own State, while the other States assume responsibility for the control of the insect east of the zone.

In July 1920 a large infestation had been found in northern New Jersey covering over 400 square miles. Work was carried on as an extermination project in cooperation with the State Department of Agriculture, and in June 1932, after repeatedly scouting and treating all infestations in the original and surrounding area embracing over 2,300 square miles, the Bureau of Entomology discontinued operations. Work has been carried on since that time by a small force employed by the State. A small infestation was found in 1933. It has been cleaned up, and no infestation has been found in the State since 1935.

Another serious infestation was found in northeastern Pennsylvania in 1932, and work in cooperation with the Bureau of Plant Industry of that State has been under way since that time. No defoliation has resulted since the year of its discovery. The area under State quarantine is approximately 1,000 square miles, and a surrounding area of 1,500 square miles will require additional inspection as the work of eliminating the insect proceeds from the outer rim toward the center of the original infestation.

Since the barrier zone was established, small colonies have been found on Long Island, in the Bronx in New York City, and at several points adjoining or directly west of the zone. Most of these have been exterminated, while in others the work is nearing completion.

The original barrier zone contained 9,400 square miles. Since it was established a number of areas have been added east of the zone, embracing 1,500 square miles in Vermont and Connecticut, making a total of 10,900 square miles. Areas on the west side of the zone, particularly in northern New York, Vermont and southern Connecticut, have been found free from infestation, and periodic inspections have been discontinued.

Prior to the discovery of the heavy infestation in Pennsylvania in 1932, regular funds required for this work were reduced 37 per cent and they have never been increased. Beginning in 1934, emergency funds were allotted for use on Federal gypsy moth projects in all the New England States, New York, New Jersey, and Pennsylvania.

Protective work has been done between the Connecticut River and the barrier zone in Vermont, Massachusetts, and Connecticut by W.P.A. labor and details from C.C.C. camps, and this combined work has reduced many serious infestations during this period.

For 16 years the maintenance of this zone and the clean-up of outlying infestations have prevented general westward spread of the insect and have eliminated the necessity for the States, aside from those now affected, to spend funds for its control or to suffer loss of trees or injury due to defoliation. The entire cost to the Federal Government from regular and emergency funds for 33 years of operation has averaged less than $700,000 per year, and the cost to infested States to maintain partial control of the insect has averaged over $1,000,000 annually. Most of the latter funds have been expended for control of the insect on street and shade trees and in parks, playgrounds, and in residential areas. If the idea is sound that "an ounce of prevention is worth a pound of cure", then the funds which have been expended by the Federal Government for protecting the rest of the United States from this insect have paid large dividends.

The present situation is very serious, and if other sections of the United States wish to receive the protection which has been given them in the past, these facts should be considered carefully. Since 1934 most of the personnel used on gypsy moth work, aside from general or district supervision, has been supplied from relief rolls. Since 1936, when the number of these employees reached more than 5,000, the force has been decreased progressively until this year, when less than 800 are employed. This force consists not only of laborers who for the most part are competent, under supervision, to do the work to which they are assigned, but also includes scouts who do inspection work to find infestations and the foremen of crews who direct this work under general supervision. The regular supervisory force has faced a tremendous task to train relief men for this work, particularly because there has been a heavy turn-over in employees. The relief employees are not a mobile force as the men are required to work locally. In many sections of the territory, particularly in the large forested areas where most of the Federal work is done, there is a very sparse population, and it is impossible to cover all the territory that should be examined on account of the location of the personnel.

Work conducted within the zone the first year after its establishment showed that numerous scattered infestations were present in the New England and New York portions. Intensive control work, consisting of scouting to locate infestations, the destruction of all gypsy moth egg clusters found and the spraying of the heaviest colonies, greatly decreased the number of infestations, and by 1930 the zone area, with the exception of southwestern Massachusetts, northwestern Connecticut and adjacent New York, was apparently free from infestation.

During the last few years infestation has built up, and large areas have been defoliated directly east of the Connecticut River, except in the State of Connecticut, and similar areas have developed during the last two years between the Connecticut River and the barrier zone in Vermont, Massachusetts, and Connecticut in spite of the fact that all of the force available has been utilized in these States.

During the last two or three seasons there has been some wind spread of small caterpillars into the zone. This is indicated by a considerable number of single egg-cluster infestations. Since the eggs were deposited in July 1939 some scouting has been done in the zone, and an unusually large number of single egg-cluster infestations have been found in towns in Vermont, Massachusetts, and Connecticut and a smaller number in the New York section of the zone. In addition to favorable conditions for wind spread, it is now evident that the hurricane which swept through New England in September 1938 has contributed to the spread of the insect to a far greater extent than was appreciated at the time. While the amount of timber that was blown down or uprooted in and near the zone was not so great as in many sections east of the Connecticut River, it is apparant, from the general course of this tremendous wind storm, that egg clusters must have spread into the zone area, to some extent at least, on leaves, bark, or other material, and that this is a contributing factor in bringing about the condition that has been found during the last few months.

Normal employment has increased in much of the territory, particularly in the industrial and manufacturing sections of the zone area. It is now impossible to secure W.P.A. labor in some sections, and as the expenditures that can be made for all nonlabor purposes under W.P.A. funds are based on man-months of labor performed, the volume of work is reduced, and sufficient equipment or supplies cannot be procured.

This project has been glad to utilize unemployed labor during the emergency through which the country has been passing, but it is clear that, unless thorough work is done in the sections where it is urgently needed, including the small infestations in the zone, the zone which was created to serve as a barrier, and the exterminative work which is being carried on in northeastern Pennsylvania, the most westerly infestation known in the United States, will fail to protect the rest of the country.

Too much emphasis cannot be placed on the fact that the money spent by the Federal Government for the prevention of spread of the insect has furnished low-cost insurance for uninfested States and the cost of treatment and loss of trees will increase rapidly if it spreads beyond the

territory it now occupies. It is of vital importance to uninfested States that this work which is their principal means of protection from this pest should be maintained at the highest possible degree of efficiency.

The expenditures made by the New England States are solely for immediate protection of the more valuable shade and ornamental trees and this work must be done annually.

In areas which are generally infested the cost of artificial control in woodlands is usually prohibitive and the loss of trees and retardation of growth caused by the insect exacts a heavy annual toll.

It would seem that the States which have been protected for many years should interest themselves in this project if they desire a continuance of this protection. As a matter of conservation and good economics it would seem desirable to keep this insect in the territory where it is now established, and thereby prevent damage to other parts of the country.